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Taxonomic Paper

Two new species of Scymnini (Coleoptera: Coccinellidae) from Karnataka, India

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Abstract

Background

The Scymnini (Coleoptera: Coccinellidae) of the Indian region is rich and highly speciose, with nearly 90 described species and scores of undescribed species (Poorani 2002). There is a dire need to systematically revise the genera and species of this tribe from the Indian region. Due to paucity of representative collections covering the entire region and lack of access to types, it is difficult to identify most of the Scymnini of the Indian region to species. As a result, many economically important species remain poorly characterized, or worse, unnamed.

New information

Two economically important and unique species of Scymnini (Coccinellidae) belonging to *Horniolus* Weise (1900) and *Scymnus* (*Pullus*) Mulsant (1846) from the Southern Indian state of Karnataka that have remained unnamed for long are treated in this paper. These species are externally similar to other known species and often misidentified. *Horniolus*

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sororius sp. n. and *Scymnus* (*Pullus*) *rajeshwariae* sp. n. (Coleoptera: Coccinellidae) are described here and illustrated with notes on their biology and related species.

Keywords

Coleoptera, Coccinellidae, *Horniolus*, *Scymnus*, new species, India

Introduction

This paper is an effort to give names to two unique species belonging to *Horniolus* Weise (1900) and *Scymnus* (*Pullus*) Mulsant (1846) that are found in the southern Indian state of Karnataka. These two genera have been traditionally placed in the tribe Scymnini under the subfamily Scymninae, both of which are no longer recognized. Under the new system of classification proposed for Coccinellidae by Seago et al. (2011) based on molecular phylogeny, Scymnini is treated as part of the composite tribe Coccidulini under the subfamily Coccinellinae. The species of *Horniolus* described here has been commonly misidentified as *H. guimeti* (Mulsant), *Scymnus* (*Pullus*) *latemaculatus* Motschulsky, and *Pharoscymnus horni* (Weise) in view of their external similarity. It is a general predator of mealybugs on coffee and other plants. The second species is a highly host-specific predator found in association with the bamboo woolly aphid, *Pseudoregma bambusicola* (Takahashi) (Hemiptera: Aphididae: Hormaphidinae) and has not been collected anywhere else from India in over fifteen years of collection. These two species are described and illustrated here.

Materials and methods

The specimens examined in this study were collected from the southern Indian state of Karnataka during the course of my studies on Coccinellidae of southern India over several years (1998-2014). A few specimens came from the collections of the erstwhile Commonwealth Institute of Biological Control-Indian Station, Bangalore (now National Bureau of Agricultural Insect Resources, Bangalore). For preparation of male and female genitalia, whole specimens were immersed in warm soapy water for 10–20 minutes depending on their age. The abdomen was gently detached with a minuten pin and kept overnight in 10% KOH. The genitalia were dissected in distilled water and transferred to glycerol for studies and imaging. After examination, the genitalia were transferred to microvials and pinned beneath the respective specimens. The following measurements were made using the measurement module of a Leica M205A stereo microscope: total length, from apical margin of clypeus to apex of elytra (TL); total width, across both elytra at their widest point (TW=EW); pronotal length, from the middle of anterior margin to the base of pronotum (PL); pronotal width at its widest (PW); elytral length along suture from apex to base including scutellum (EL). Images of immature stages were taken with a Nikon D7000 DSLR camera. Images of whole specimens and their diagnostic characters were

taken using a Leica DFC 420 camera attached to a Leica M205A stereo microscope. Composite images were generated from image stacks using Combine ZP and touched up in Adobe Photoshop Elements 11. The specimens studied are deposited in the following collections:

NBAIR – National Bureau of Agricultural Insect Resources, Bangalore

UASB – University of Agricultural Sciences, Bangalore

Taxon treatments

Scymnus (*Pullus*) *rajeshwariae* Poorani, sp. n.

- ZooBank urn:lsid:zoobank.org:act:3FF45295-D9C9-4D94-9C56-FFF8159A2B08

Materials

Holotype:

a. continent: Asia; country: India; stateProvince: Karnataka; municipality: Bangalore; locality: Hebbal; verbatimCoordinates: 13°01'N, 77°35'E; eventDate: 2002-01-01; eventRemarks: Feeding on *Pseudoregma bambusicola* on bamboo; sex: male; preparations: whole animal

Paratype:

a. continent: Asia; country: India; stateProvince: Karnataka; municipality: Bangalore; locality: Hebbal; verbatimCoordinates: 13°01'N, 77°35'E; eventDate: 2002-01-01; eventRemarks: Feeding on *Pseudoregma bambusicola* on bamboo; sex: 7 males, 8 females; preparations: whole animal

Description

Length: 2.50–2.90 mm; Width: 1.70–2.10 mm; TL/TW: 1.33–1.40; PL/PW: 0.52–0.58; EL/EW: 0.97–1.05; EW/PW: 1.34–1.43. **Male**: Body outline (Fig. 1e) elongate oval, broadest around middle of elytra, elytra apically somewhat broadly rounded to subtruncate; dorsum densely pubescent with silvery white hairs. Head dark pitchy brown to black, anterior clypeal margin slightly lighter; pronotum black except anterior and lateral margins narrowly reddish testaceous; elytra black, apical one-fourth reddish brown-testaceous. Ventral side with mouthparts, legs and abdominal ventrites dark brown to testaceous, middle of abdominal ventrite 1 and remaining areas dark pitchy brown. Head with interocular distance about 1.7x as wide as an eye; punctures dense in posterior half, slightly more widely spaced towards clypeal margin, separated by <0.5–1 diameter. Antenna 11-segmented with a distinct club. Pronotum with punctures on disc shallow, separated by 1–4 diameters, denser and more closely spaced on lateral sides, separated by <1–2 diameters. Elytra with shallowly impressed punctures, slightly larger and denser than that on pronotum, separated by 1–2 diameters on disc, slightly coarser, denser and more closely spaced around anterolateral margins, interspaces between punctures coriaceous; with a row of slightly larger punctures on either side of suture in anterior half. Prosternal process (Fig. 2a) with a pair of apically

divergent carinae. Abdominal postcoxal lines (Fig. 2c) complete, broadly semicircular to boat-shaped, area enclosed densely punctate in anterior half, punctures coarser and fewer in posterior half, apical one-fourth adjacent to postcoxal line more or less smooth, devoid of punctures. Ventrite 5 with posterior margin weakly emarginate, ventrite 6 truncate. Tarsi pseudotrimerous. Tarsal claws bifid with a basal tooth (Fig. 2b). Male genitalia (Fig. 2d, e, f) with penis guide lanceolate in ventral view (Fig. 2e), parameres shorter than penis guide in lateral view (Fig. 2d), bilobate with triangular / subconical inner expansions in anterior half, inner expansion much shorter than outer, with long apical hairs reaching beyond apex of outer lobe, apices of outer lobes of parameres with much longer, denser hairs reaching beyond apex of penis guide. Penis (Fig. 2f) coiled with a prominent capsule having a distinctly longer outer arm than inner arm, penis apex membranous with a short, hook-like projection.

Female: Similar to male. Tarsal claws (Fig. 2b) with a more transverse basal tooth than in male, anterior process distinctly shorter than posterior (in male basal tooth more distinctly quadrate, posterior process only slightly longer than anterior). Last abdominal ventrites not showing any marked dimorphism, ventrite 5 with posterior margin broadly arcuate, ventrite 6 subtruncate. Female genitalia (Fig. 1f) with spermatheca having well differentiated cornu, nodulus and ramus and a sclerotised rod-like projection on bursa.

Diagnosis

Scores of Oriental species of Scymnini are externally similar to *S.* (*P.*) *rajeshwariae* sp. n. in having black elytra with reddish brown / testaceous apices and are difficult to identify without examination of male genitalia. But the habits and male genitalia of this species appear to be unique. The male genitalia are very distinctive with bilobed parameres and the penis guide is apically lanceolate.

Etymology

This species is named for Ms. S.K. Rajeshwari, Technical Officer, NBAIR, who has been a great help and support in my work on Coccinellidae.

Distribution

India: Karnataka.

Biology

It appears to be a highly specific predator of the bamboo woolly aphid, *Pseudoregma bambusicola* (Takahashi) and is collected always in association with this species only. The larvae are greyish with white waxy dusting and lack the usual dense waxy filaments in many other *Scymnus* spp. (Fig. 1a, b, c). The larvae are commonly seen in aphid colonies on bamboo stem, but the adults are more cryptic in their habits and found feeding only under the leaf sheaths. There are several common predators of *P. bambusicola* which occur along with this species. These include the giant bamboo

ladybirds, *Synonycha grandis* (Thunberg) and *Megalocaria dilatata* (F.) (Coccinellidae), *Dipha aphidivora* (Meyrick) (Lepidoptera: Pyralidae), and *Dideopsis aegrota* (F.) (Diptera: Syrphidae). In view of its specificity, this species could be a potential biological control agent of *P. bambusicola* on bamboo.

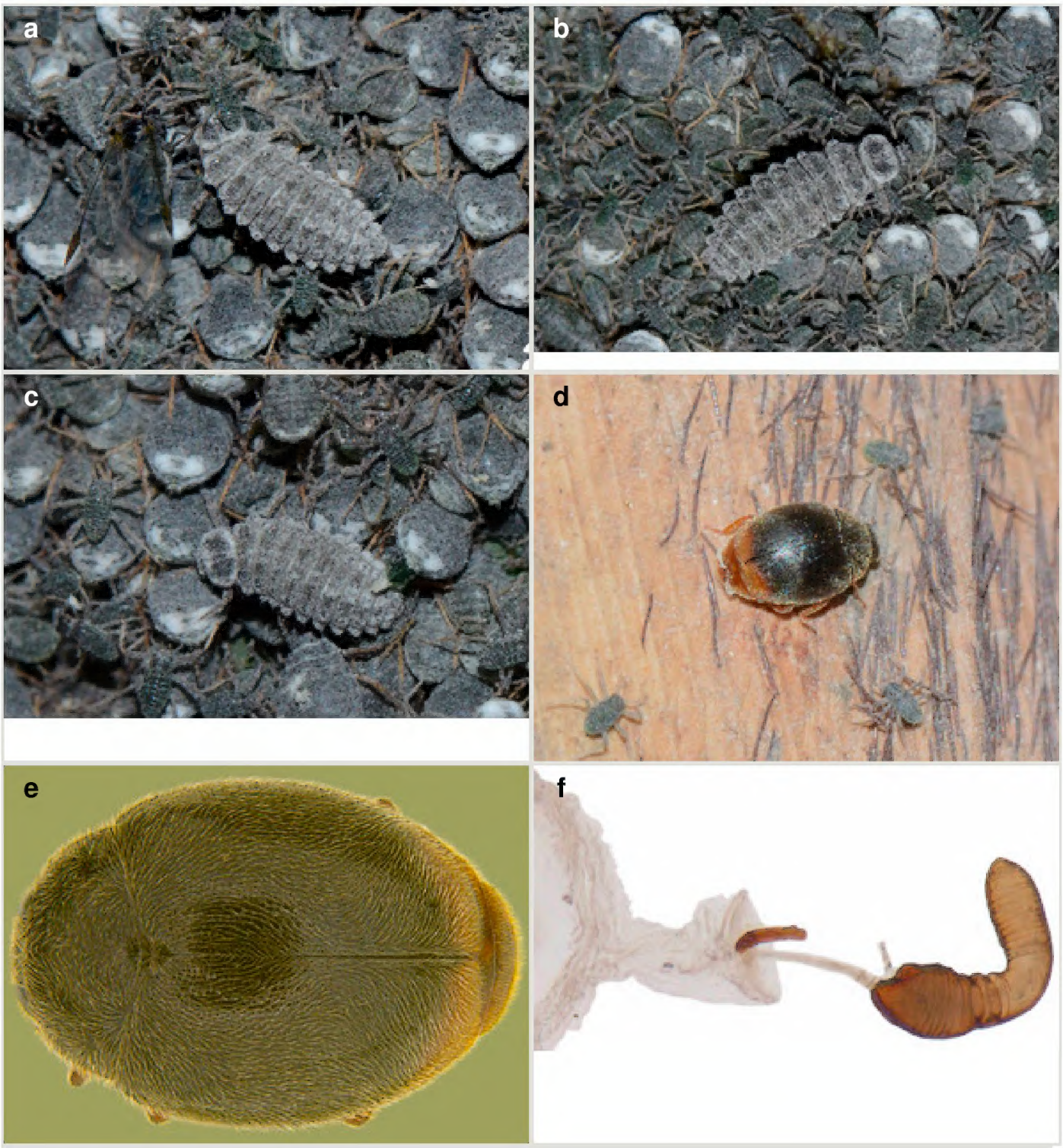

Figure 1.

Scymnus (*Pullus*) *rajeshwariae* sp. n.

a: Larva feeding on *Pseudoregma bambusicola* on bamboo
b: Larva feeding on *Pseudoregma bambusicola* on bamboo
c: Larva feeding on *Pseudoregma bambusicola* on bamboo
d: Adult feeding on *Pseudoregma bambusicola* on bamboo
e: Adult, dorsal view
f: Female genitalia: Spermatheca

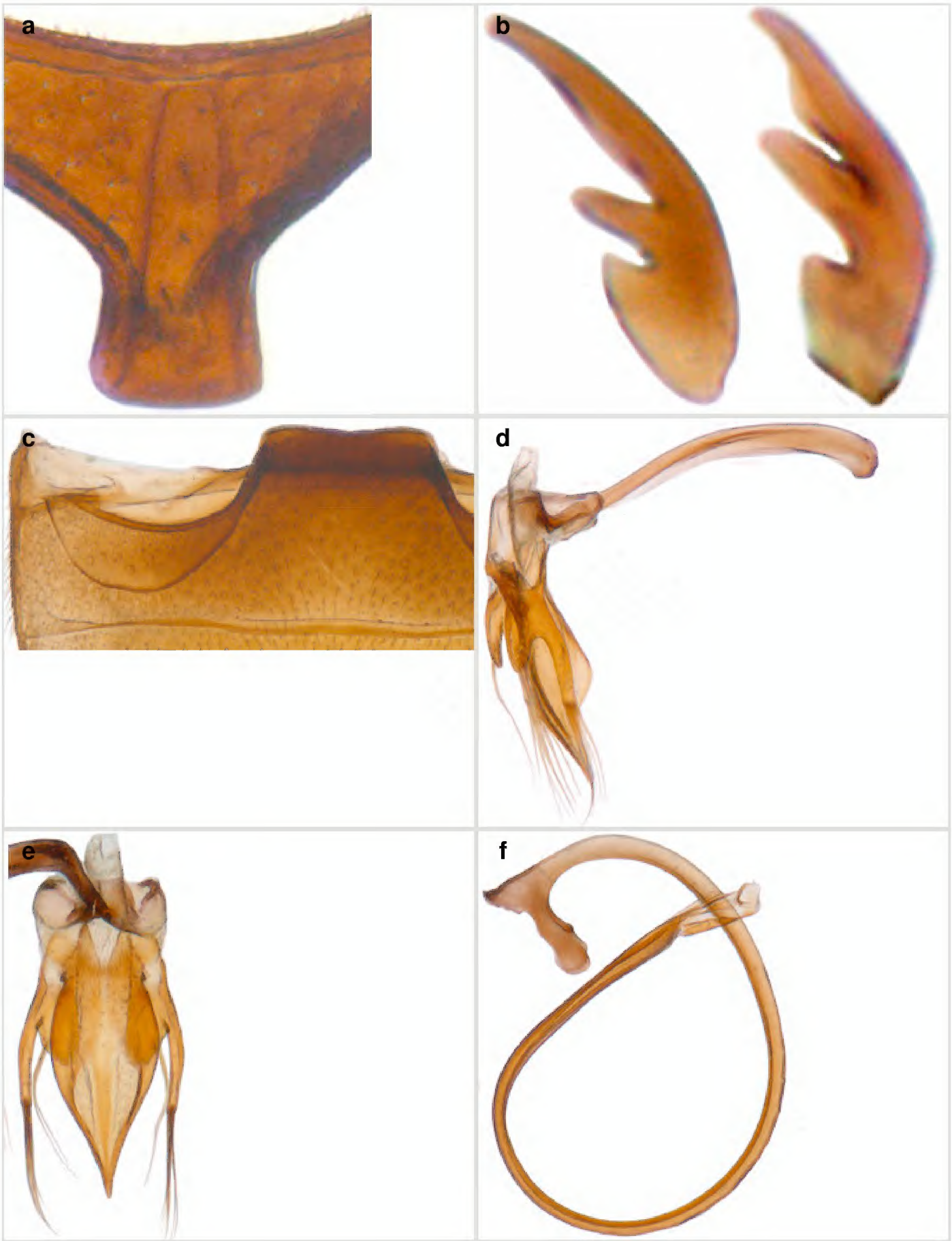

Figure 2.

Diagnostic characters of *Scymnus* (*Pullus*) *rajeshwariae* sp. n.

a: Prosternal process
b: Tarsal claw in female (left) and male (right)
c: Abdominal postcoxal line
d: Male genitalia: Tegmen, lateral view
e: Male genitalia: Tegmen, ventral view
f: Male genitalia: Penis

Horniolus sororius Poorani, sp. n.

- ZooBank urn:lsid:zoobank.org:act:738B0BE1-73C8-477E-9C1A-3475CB9C3930

Materials

Holotype:

a. continent: Asia; country: India; stateProvince: Karnataka; locality: Balehonnur; verbatimLocality: Central Coffee Research Station; year: 1999; habitat: Coffee plantation; institutionID: ICAR-National Bureau of Agricultural Insect Resources; institutionCode: NBAIR; ownerInstitutionCode: NBAIR

Paratype:

a. continent: Asia; country: India; stateProvince: Karnataka; locality: Central Coffee Research Station, Balehonnur; eventDate: 1999; year: 1999; habitat: coffee plantation; individualCount: 6; recordedBy: P.K. Vinod Kumar; identifiedBy: J. Poorani; institutionID: NBAIR; institutionCode: NBAIR; ownerInstitutionCode: NBAIR

b. continent: Asia; country: India; stateProvince: Karnataka; locality: PDBC, Bangalore; eventDate: vi.2002; year: 2002; habitat: on wing; individualCount: 1; recordedBy: Sunil Joshi; identifiedBy: J. Poorani; institutionID: NBAIR; institutionCode: NBAIR; ownerInstitutionCode: NBAIR

c. continent: Asia; country: India; stateProvince: Karnataka; locality: Hessarghatta, Bangalore; eventDate: 3.vi.2009; year: 2009; individualCount: 1; recordedBy: L. Lakshmi; identifiedBy: J. Poorani; institutionID: NBAIR; institutionCode: NBAIR; ownerInstitutionCode: NBAIR

Other material:

a. country: India; stateProvince: Karnataka; locality: Bangalore; eventDate: 1958-12-11; year: 1958; month: 12; day: 11; verbatimEventDate: 11XII1958; habitat: Resting on *Eleusine coracana*; individualCount: 1; sex: female; institutionID: NBAIR; datasetID: CIBC-BS

b. continent: Asia; country: India; stateProvince: Karnataka; locality: Hebbal, Bangalore; eventDate: 2001-09; year: 2001; month: 09; day: 09; verbatimEventDate: 09092001; habitat: Feeding on *Aleurodicus dispersus*; individualCount: 1; sex: female; institutionID: NBAIR; datasetID: CIBC-BS

Description

Length: 2.20-2.65 mm; width: 1.65–1.80 mm. **Male**: Body (Fig. 3) elongate oval, moderately convex. Head and pronotum testaceous to dark brown, elytra dark brown with four yellowish spots – first pair transverse, roughly quadrate, located before middle in anterior half, second pair smaller, transverse, located around 4/5th of elytra, both spots occasionally larger, almost touching lateral margins of elytra; head with elongate silvery white hairs, pronotum with yellowish white to brownish pubescence, elytra with a mixture of dark brown and yellowish white hairs, those on elytral spots paler, those on rest of elytra predominantly brown to black. Ventral side more or less uniform reddish brown, pro-, meso- and metasternites darker reddish brown, tarsi of legs slightly lighter, yellowish brown. Head with clypeal margin carinate, punctures separated by 2-3 diameters, denser and separated by less than their own diameter near eye margins. Pronotum densely punctate on posterior and lateral margins, slightly more widely

spaced on disc, separated by 3-5 diameters. Elytral punctures denser and slightly larger than those on pronotum, separated by 2-5 diameters on disc, punctures on lateral sides and apices more closely spaced. Prosternal process with an inverted Y-shaped carina. Abdominal postcoxal line (Fig. 4a) complete and semicircular, area enclosed by postcoxal line sparsely punctate with few punctures along anterior margins. Ventrite 5 truncate, ventrite 6 barely emarginate. Tarsi trimerous. Male genitalia (Fig. 4b, c, d, e) with tegmen in ventral view (Fig. 4b, c) with penis guide shorter than parameres, apically very slightly asymmetrical, broadest at base, progressively narrowed to apex, apical one-fifth triangular; parameres longer than penis guide, apices with elongate hairs. Penis capsule (Fig. 4d) with a prominent inner arm, outer arm lacking; apex of penis (Fig. 4e) strongly flattened or spatulate, densely spotted. **Female**: Similar to male. Ventrite 6 apically weakly arcuate. Genitalia with spermatheca (Fig. 4f) with spermatheca tubular, long and intricately coiled, sperm duct elongate and progressively broader.

Figure 3.

Horniolus sororius sp. n.

a: Dorsal view
b: Lateral view

Diagnosis

The external appearance of *H. sororius* sp. n. is very similar to that of *Horniolus vietnamicus* Miyatake. *Horniolus hisamatsui* Miyatake also has a similar elytral pattern, but it has reddish brown head and pronotum. But the male genitalia, particularly the enlarged siphonal apex, are diagnostic and unique to this species. *Horniolus sororius* sp. n. is also similar to two common Indian species, *Scymnus* (*Pullus*) *latemaculatus* Motschulsky (Fig. 5a), and *Pharoscymnus horni* (Weise) (Fig. 5d). The former is close to *H. sororius* sp. n. in general appearance, but can be distinguished by the presence of parallel, apically divergent carinae on the prosternal process and the male genitalia (Fig. 5b, c) are also diagnostic. Besides, it is one of the most common general predators of aphids in India. *Pharoscymnus horni* can be differentiated from *H. sororius* sp. n. by its distinctly more rounded body outline and other generic characters.

Figure 4.

Diagnostic characters of *Horniolus sororius* sp. n.

a: Abdominal postcoxal line
b: Male genitalia: Tegmen, ventral view
c: Male genitalia: Tegmen, ventral view
d: Male genitalia: Penis
e: Male genitalia: Penis apex
f: Female genitalia: Spermatheca

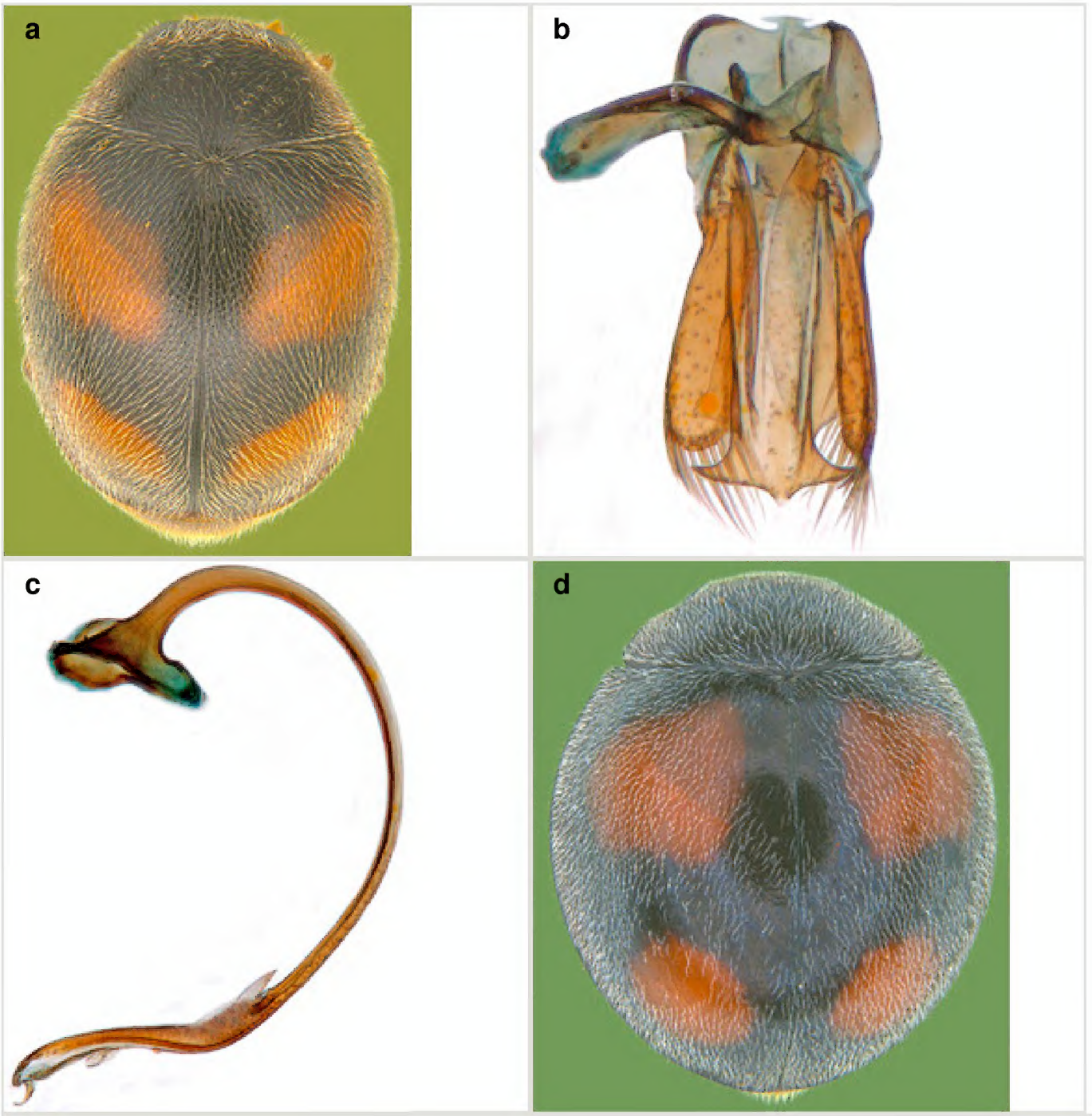

Figure 5.

Scymnus latemaculatus Motschulsky and *Pharoscymnus horni* (Weise)

a: Adult of *S. latemaculatus*, dorsal view
b: Male genitalia of *S. latemaculatus*: Tegmen, ventral view
c: Male genitalia of *S. latemaculatus*: Penis
d: Adult of *P. horni*, dorsal view

Etymology

The specific epithet is a Latin adjective (“sororius” L.= of a sister, sisterly) in reference to its similarity to other common species.

Distribution

India: Karnataka.

Biology

Collected in association with coffee mealybugs and on *Eleusine coracana* (label data). This species was recorded by Ramani et al. (2002) (as *Horniolus* sp.) as a predator of spiralling whitefly, *Aleurodicus dispersus* Russell (Hemiptera: Aleyrodidae).

Notes

Horniolus is an Oriental genus and only three species, *H. dispar* Weise (1900) (from Sri Lanka), *H. nigripes* Miyatake (1976) (from southern India) and *H. hisamatsui* (Nepal) are represented in the Indian subcontinent. *Horniolus guimeti* (Mulsant), distributed in Malaysia and Borneo, has been mentioned in literature from the Indian subcontinent, but is a doubtful record for India (R.G. Booth, BMNH, *in litt.*). Korschefsky (1931) includes India in its distribution range, but Indian records of *H. guimeti* are mostly misidentifications of *Scymnus* (*Pullus*) *latemaculatus* (Fig. 5a), and *Pharoscymnus horni*, which are externally similar.

References

- Korschefsky R (1931) Coleopterorum Catalogus. Pars 118. Coccinellidae I. W. Junk, Berlin, 224 pp.
- Miyatake M (1976) Descriptions of five new species of the genus *Horniolus* Weise of south east Asia (Coleoptera: Coccinellidae). Transactions of the Shikoku Entomological Society 13: 29-37.
- Mulsant E (1846) Securipalpes. Histoire Naturelle des Coleopteres de France. Vol. 4. Deyrolle, Naturaliste, Paris, 380 pp. [In French].
- Poorani J (2002) An annotated checklist of the Coccinellidae (Coleoptera) (excluding Epilachninae) of the Indian subregion. Oriental Insects 36: 307-383. DOI: 10.1080/00305316.2002.10417335
- Ramani S, Poorani J, Bhumannavar BS (2002) Spiralling whitefly, *Aleurodicus dispersus* Russell, in India. Biocontrol News and Information 23 (2): 55N-62N.
- Seago AE, Giorgi JA, Jiahui L, Slipinski A (2011) Phylogeny, classification and evolution of ladybird beetles (Coleoptera: Coccinellidae) based on simultaneous analysis of molecular and morphological data. Molecular Phylogenetics and Evolution 60: 137-151. DOI: 10.1016/j.ympev.2011.03.015
- Weise J (1900) Coccinelliden aus Ceylon gesammelt von Dr. Horn. Deutsche Entomologische Zeitschrift 44: 417-448. DOI: 10.1002/mmnd.48019000237